

SUMMARY OF STATEWIDE MERCURY WORKGROUP MEETING

May 3, 2007

DEQ Building #2, Conference Room 101

168 N 1950 W

Salt Lake City, UT 84114-4850

WORK GROUP MEMBERS PRESENT

Kent Hauck: Utah Dept. of Agriculture

Bill Johnson: University of Utah

Nathan Darnall: US Fish and Wildlife Service

Kevin Okleberry: Salt Lake Valley Health Department

Scott Everett: UDEQ DERR

Wayne Ball: Utah Dept. of Health

Walt Donaldson: Utah Div. of Wildlife Resources

Bruce Waddell: Private Duck Clubs

Paul Dremann: Trout Unlimited

Dave Naftz: USGS

Cheryl Heying: UDEQ DAQ

Jeff Salt: Great Salt Lake Keeper

Sue Odekirk: PacifiCorp

Kathy Van Dame: Wasatch Clean Air Coalition

John Whitehead: UDEQ DWQ

Jane Bowman: Utah Medical Association

Jason Walker: N.W. Band of the Shoshone Nation

OTHERS IN ATTENDANCE

Amy Dickey: UDEQ DWQ

Larry Scanlan: Utah Health Laboratory

Rob Powers: UDEQ SHW

Leah Ann Lamb: UDEQ

Bill Sinclair: UDEQ

Chris Bittner: UDEQ SHW

Tom Aldrich: UDWR

Maunsel Pearce: Utah Doctors for Clean Air

Alaine Southworth: DCD

Clay Perschon: UDWR

Lynn deFreitas: Friends of GSL

Veronica Padilla

Drew Papposkis

I. GREETINGS/MEETING CALLED TO ORDER

John Whitehead, Chair, called the meeting to order at 9:00 AM. He welcomed the Workgroup and the public.

II. REVIEW OF JANUARY 25, 2007 MEETING SUMMARY

Bruce Waddell noted that the names of several participants were missing from the summary on the funding subcommittee. That omission will be corrected. The Workgroup then approved the meeting summary from January 25, 2007.

III. CLAY PERSCHON: GSL WATERFOWL MERCURY TESTING RESULTS

Mercury impacts to adult birds are numerous. They can include decreased nesting effort, increased abandonment, decreased survival rates, and direct mortality. Impacts to young birds include teratogenic/mutagenic effects, no eyes, brain development outside the skull, malformed appendages, and decreased growth rates.

It has been shown that mercury and selenium interact and cause synergistic effects. Female mallard reproduction decreases when both mercury and selenium are present. UDWR first became interested in mercury in the Great Salt Lake in 2003-2004 when the USGS identified high concentrations of methylmercury. Near this time, DEQ and DWR surveys identified high levels of mercury in fish. In 2005, the Utah Waterfowlers Association questioned mercury level in ducks known to be on the GSL for a part of their life cycle.

DWR initiated a mercury study in 2004 with assistance from Utah State University researchers. They studied winter water bird diet by analyzing ducks, gulls and grebes. Those samples were analyzed in the summer of 2005. Edible tissue (skin, breast) of Green Winged Teal, Northern Shovelers, and Common Goldeneye was analyzed. These results represented the worst case scenario because the birds had been on the GSL all season. Results showed Green Winged Teal with mercury levels below the EPA criterion. Concentrations of mercury in muscle tissue were always significantly higher than in the skin. Common Goldeneye had concentrations above the criterion on skin and muscle, while Shovelers had high concentrations on muscle only.

In 2005, a Utah Health Advisory was issued by UDOH, DWQ, and DWR two days prior to duck season advising not to consume Shovelers and Goldeneye. This was the first “do not eat” waterfowl advisory issued in North America. It was unique since most are frequency of meal type advisories rather than do not eat advisories.

In the fall of 2005 a second phase was conducted in late summer, fall and winter with a public health focus. This was a temporal and spatial survey of migratory and local GSL ducks commonly harvested by hunters. Areas checked included the Bear River Bay, Ogden Bay, Farmington Bay, and the South Arm. Data was compiled late summer of 2006 and in September 2006 UDOH issued a frequency of meal advisory for Common Goldeneye, Northern Shovelers, and Cinnamon Teal.

DWR conducted a third phase in the fall 2006. Canada geese and coots were sampled and analysis is currently being conducted. A fourth study phase is being planned with focus on late summer and early fall of 2007 that may include flightless birds.

Three to five million ducks come through Utah annually from Alaska, Canada, Mexico, California, Central America, adjacent states and the gulf coast. Therefore, mercury contamination in waterfowl is not just a local problem. Band recovery studies have shown a huge range of travel for Shovelers, Mallards, and Cinnamon Teal. Next up for

DWR is expanding sampling to other drainages, species and seasons. They would also like to explore the impacts of mercury on avian reproduction and survival, as well as study sources and sinks of mercury in the GSL.

Jeff Salt: DWR used samples collected by hunters for their bird studies. Why can't anglers contribute fish from around the state for mercury analysis?

Reply: Data quality and reliability are of the utmost importance. DWR folks do on site bag checks so they have absolute confidence in source, species, and instantaneous preservation.

Scott Everett: Do the advised species have similar feeding habits? Will DWR sample other media that are food sources?

Reply: Yes, the birds have similar feeding habits. DWR will look into other media sometime in the future, but public health is the main concern and resources are limited so it hasn't happened yet.

Cheryl Heying: Commented that May Gustin with University of Nevada at Reno is looking at mercury in brine shrimp. No data is available yet.

Nathan Darnall: USFWS has collected brine shrimp and brine flies and is waiting for the results.

IV. JOHN WHITEHEAD: RECAP ON RECENT FISH TISSUE ADVISORIES

John summarized the 6 fish advisories that were issued April 23, 2007 by UDOH. These were included in the 14 areas of concern discussed at the workgroup meeting in January. The sites listed include:

- Joe's Valley Reservoir (Splake Trout)
- Calf Creek (Brown Trout)
- Newcastle Reservoir (Rainbow Trout)
- Weber River (Brown Trout)
- Jordanelle Reservoir (Brown Trout)
- Upper Enterprise Reservoir (Rainbow Trout)

More info is available at http://www.deq.utah.gov/Issues/Mercury/fish_advisories.htm

V. CHRIS BITTNER: OVERVIEW ON STATISTICAL APPROACH USED FOR ADVISORIES

Why statistics? The parameter of concern is the average concentration of mercury in fish. We must infer the average concentration from a small subset of fish sampled. Statistics can tell us how many fish or ducks we need to take to be confident in our decision making. Several factors affect the number of samples needed including variability in concentrations, confidence desired, and detectable difference.

The two hypotheses tested through this process include H_0 , which says the average mercury concentration is less than or equal to 0.3 mg/kg and H_a , which says the average concentration is greater than 0.3 mg/kg.

Two errors are possible. The first is a Type I error, in which you conclude that the mean is > 0.3 mg/kg when it's not. For the Utah advisories a maximum error rate was set to 10%. There is also a Type II error, in which you conclude that the concentration is less than or equal to 0.3 mg/kg when it is really greater than that. Max acceptable error rate for this was set to 20%.

The minimum detectable difference defines the grey region where potential difference in means is too close to call. Error rates decrease rapidly with higher concentrations. Error rates are higher if the true mean concentration is near the screening level of 0.3 mg/kg.

VI. WAYNE BALL: BRIEFING ON EPA VERSUS FDA MERCURY LEVELS

The Utah Department of Health (UDOH) uses the more restrictive EPA screening value of 0.3 mg/kg for fish consumption advisories instead of the FDA action level of 1 mg/kg. The screening value is the concentration of mercury in fish which warrants further investigation. The action level is an administrative guideline that defines the extent of contamination at which FDA may regard food as adulterated and represents the limit at which or above FDA may take legal actions to remove the food product from the marketplace. The FDA methodology was never intended to be used for advisories.

The reference dose (RfD) = 0.0001 mg/kg/day = estimate of daily exposure to the human population that is likely to be without adverse effects when experienced over a lifetime. Both the FDA and EPA recommend that women and children do not eat shark, swordfish, tilefish and king mackerel. They are encouraged to eat up to 12 oz/week of a variety of low mercury fish such as shrimp, canned tuna, catfish, salmon, and pollack and to always know what the local advisories are.

The final 2007 Mercury in Fish Report is available at www.health.utah.gov/enviroepi

Jeff Salt: Stated that there needs to get more consistent information out. How can we ensure that people who are making recommendations to others are getting accurate information about mercury?

Reply: It's an advisory, not a regulatory limit. UDOH will do their best to make sure the correct message is being disseminated.

VII. DAVE NAFTZ: USGS MERCURY WORK ON THE GREAT SALT LAKE

The USGS mercury monitoring program is ongoing. USGS has continuous GSL inflow sites, GSL lake and bay sites, and intermittent discharge sites. This data will be used to calculate loading of mercury to the lake. This data can then be used to calculate the mass of mercury in the lake because we know the volume of the lake and the mercury concentrations. USGS will be able to determine how much mercury is coming in with surface water and perhaps see how much is coming from atmospheric deposition.

In the summer of 2006 lake cores were collected by USGS. Two of the three cores did not have active sedimentation. One showed over 100 years of sediment deposition. With that information we can compare present to past mercury deposition. Five additional cores will be collected this summer to gather a detailed chronology and critical mercury data.

The concentration of methylmercury is very high in the deep brine layer (bottom 2 m in GSL). USGS asked how this methylmercury is getting into the more biologically available zones of the lake. Internal waves are created along the thermocline and those waves stir sediment, mixing the brine layers and creating a transport mechanism. If the water is moving, is the mercury? The signal to noise ratio is being used as a qualitative indicator of whether or not mercury is moving along the interface. The ratio shows movement of particulates assumed to include mercury, which are a great food source for brine shrimp.

USGS partnered with the Bureau of Land Management (BLM) in the southwest corner of state to test tailings leachates from abandoned mines. The results showed elevated concentrations of mercury, with some values as high as 10,000 ng/l.

USGS will continue work with the summer coring efforts on the GSL, as well as sediment core and water sampling in southwest Utah. They will also conduct a statewide snow monitoring survey and continue GSL and inflow monitoring.

VIII. JOHN WHITEHEAD: 2007-2008 FISH TISSUE MONITORING DRAFT PLAN

DWQ has developed a draft 2007 Fish Tissue Sampling Plan. It includes two reservoirs from southwest Utah, where high mercury concentrations have been seen in the past. DWQ will also check the fish from hatcheries from three areas of state to see if they are contributing mercury. The Escalante drainage will be sampled more extensively since last year's results showed that something is going on spatially there. Cache County will be sampled since DWQ has minimal data from that area. DWQ is trying to sample human health hot spots, so the sampling plan is not yet random. The number of sites sampled will depend on the funding available. If any workgroup members have comments please get them to John Whitehead as soon as possible at jwhitehead@utah.gov.

Walt Donaldson: Said he feels comfortable with DWR collecting fish at most of the sites listed. They want more focus in southwest Utah, especially since USGS had interesting results. Perhaps DWQ could drop Fish Lake or Flaming Gorge for now and shift those resources to further investigating the southwest corner of the state.

Paul Dremann: Paul will discuss the draft sampling plan with the Blue Ribbon Council and others who might be interested.

Scott Everett: Can we see where the USGS mine data came from? Where are the mine locations? Is DOGM part of this statewide mercury workgroup? Maybe they should be involved at the table.

Dave Naftz: Dave will look into getting the mine location information. He said USGS also did work in the San Rafael area checking approximately 120 abandoned mine sites. No high mercury concentrations were seen.

IX. CHERYL HEYING: UPDATE ON UTAH'S AIR MERCURY RULE

The air quality board adopted EPA's Clean Air Mercury Rule (CAMR) and it became effective April 30, 2007. Utah wanted to develop a state specific plan to regulate sources, specifically coal fired power plants. DAQ developed R307-424, a state only rule that doesn't need EPA approval. The cap and trade federal program does not address hot spot areas, so that's why Utah adopted this state specific plan. The air quality board has adopted this rule, and it will take DAQ a step closer to effective monitoring of mercury emissions. DAQ also hopes to refine mercury deposition analysis models with EPA. None of the existing models have been verified in the arid west.

X. BRUCE WADDELL: REPORT FROM FUNDING SUBCOMMITTEE

One of the goals of the funding subcommittee was to identify areas of planned and desired research from all agencies. The subcommittee recently put together a spreadsheet identifying these needs. The spreadsheet shows the numerous projects and includes estimates of funding. Hopefully it can be used as a tool to help facilitate coordination amongst agencies, help in the search for funding, and be used to educate legislators.

XI. PROPOSED AGENDA ITEMS FOR NEXT MEETING

Jeff Salt: Discussion of the upcoming conference on mercury. The theme will be mercury in the west. Perhaps the workgroup could provide input.

Nathan Darnall: Present on the completed study on dynamics of mercury in grebes on the Great Salt Lake.

Jane Bowman: Follow up with Baby Your Baby folks on getting the most current information on mercury dispersed to the public.

NEXT MEETING: AUGUST 23, 2007. DEQ BUILDING 2, RM 101, 9:00 AM